

WHAT IS CLAIMED IS:

1. A dielectric ceramic article precursor comprising from about 1 wt.% to about 99 wt.% of a crystalline aluminosilicate zeolite or an amorphous aluminosilicate derived from the zeolite, from about 99 wt.% to about 1 wt.% of a glass phase, and from about 1 to about 10 wt.% of ZnO, the zeolite having a composition on an anhydrous basis represented by an empirical formula of:



where A is an exchangeable cation selected from the group consisting of alkali metals, alkaline earth metals, transition metals, zinc, rare earth metals and mixtures thereof, "n" is the valance of A and varies from about 1 to about 3, "x" has a value from about 1 to about 10 and "y" has a value which balances the sum of the valences of (A + Si + Al).

2. The ceramic article precursor of claim 1 where the crystalline aluminosilicate zeolite or amorphous aluminosilicate is present in an amount from about 5 wt.% to about 95 wt.%.
3. The ceramic article precursor of claim 1 where the zinc oxide is present in an amount from about 3 wt.% to about 7 wt.%.
4. The ceramic article precursor of claim 1 where the zinc oxide has an average particle size of less than 1 micron.
- 20 5. The ceramic article precursor of claim 1 characterized in that it is in the shape of a tape.

6. The ceramic article precursor of claim 1 where A is selected from the group consisting of magnesium, calcium, strontium, zinc, barium and mixtures thereof.
7. The ceramic article precursor of claim 1 where the zeolite is selected from the group consisting of phillipsite, harmotome, gismondine, zeolite B, zeolite ZK-19, zeolite W, zeolite Y, zeolite L, zeolite LZ-210, zeolite omega, zeolite LZ-202 and mixtures thereof.  
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8. The ceramic article precursor of claim 5 where the zeolite is zeolite B.
9. The ceramic article precursor of claim 1 further characterized in that it comprises a forming aid selected from the group consisting of binders, plasticizers, surfactants and mixtures thereof.  
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10. The ceramic article precursor of claim 7 where the binder is selected from the group consisting of polyvinyl alcohol, polyvinyl butyral, polyvinyl chloride, cellulose acetate, nitrocellulose, methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, hydroxpropyl methyl cellulose, polyacrylate esters, polymethyl methacrylate, polyethyl methacrylate, polyethylene, polyalkylene glycol, petroleum resins, ethylene oxide polymer, polypropylene carbonate, polytetrafluoroethylene, poly-alpha-methyl styrene, and mixtures thereof.  
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11. The ceramic article precursor of claim 7 where the plasticizer is selected from the group consisting of n-butyl phthalate, dioctyl phthalate, butyl benzyl phthalate, polyethylene glycol, polypropylene glycol, glycerine, ethyltoluene sulfonamides, tri-n-butyl phosphate, butyl sterate and mixtures thereof.  
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12. The ceramic article precursor of claim 7 where the surfactant is selected from the group consisting of polyisobutylene, linoleic acid, oleic acid, citric acid, stearic acid, lanolin fatty acids, corn oil, safflower oil, glycerol trioleate, dibutyl amine, substituted imidazolines, sulfonates, phosphate esters, and mixtures thereof.

5      13. The ceramic article precursor of claim 7 where the forming aid is present in an amount from about 2 to about 10 wt.%.

14. A process for preparing a dielectric ceramic article comprising forming a mixture of a crystalline aluminosilicate zeolite or an amorphous aluminosilicate derived from the zeolite, a zinc oxide (ZnO) additive and a glass phase into a shaped article and calcining the shaped article at a temperature of about 700° to about 1000°C for a time of about 0.25 to about 1 hrs, the crystalline aluminosilicate zeolite having a composition on an anhydrous basis represented by an empirical formula of:



15      where A is an exchangeable cation selected from the group consisting of alkali metals, alkaline earth metals, transition metals, zinc, rare earth metals and mixtures thereof, “n” is the valence of A and varies from about 1 to about 3, “x” has a value from about 1 to about 10 and “y” has a value which balances the sum of the valences of (A + Si + Al) and where the zeolite or amorphous aluminosilicate is present in an amount from about 1 wt.% to about 99 wt.%, the zinc oxide is present in an amount from about 1 to about 10 wt.% and the glass phase is present in an amount from about 99 wt.% to about 1 wt.%.

20      15. The process of claim 14 where the mixture is cast into a tape.

16. The process of claim 14 where the zeolite is selected from the group consisting of phillipsite, harmotome, gismondine, zeolite B, zeolite ZK-19, zeolite W, zeolite Y, zeolite L, zeolite LZ-210, zeolite omega, zeolite LZ-202 and mixtures thereof.

17. The process of claim 14 where the zeolite is zeolite B.

5     18. The process of claim 14 further characterized in that the mixture comprises a forming aid selected from the group consisting of binders, plasticizers, surfactants and mixtures thereof.

19. The process of claim 16 where the binder is selected from the group consisting of polyvinyl alcohol, polyvinyl butyral, polyvinyl chloride, cellulose acetate, 10 nitrocellulose, methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, hydroxpropyl methyl cellulose, polyacrylate esters, polymethyl methacrylate, polyethyl methacrylate, polyethylene, polyalkylene glycol, petroleum resins, ethylene oxide polymer, polypropylene carbonate, polytetrafluoroethylene, poly-alpha-methyl styrene and mixtures thereof.

15     20. The process of claim 16 where the plasticizer is selected from the group consisting of n-butyl phthalate, dioctyl phthalate, butyl benzyl phthalate, polyethylene glycol, polypropylene glycol, glycerine, ethyltoluene sulfonamides, tri-n-butyl phosphate, butyl sterate and mixtures thereof.

21. The process of claim 16 where the surfactant is selected from the group consisting 20 of polyisobutylene, linoleic acid, oleic acid, citric acid, stearic acid, lanolin fatty acids, corn oil, safflower oil, glycerol trioleate, dibutyl amine, substituted imidazolines, sulfonates, phosphate esters and mixtures thereof.

22. The process of claim 16 where the forming aid is present in an amount from about 1 to about 10 wt.%.

23. The product of the process of claim 14.

24. The process of claim 14 further characterized in that the mixture is dispersed in a  
5 solvent to form a slurry prior to forming a shaped article.

25. The process of claim 22 where the solvent is selected from the group consisting of toluene, methyl ethyl ketone, ethanol, methanol, xylenes, acetone and mixtures thereof.